POPULAR MECHANICS

An Illustrated Weekly Review of the Mechanical Press of the World

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Smithsonian Institution

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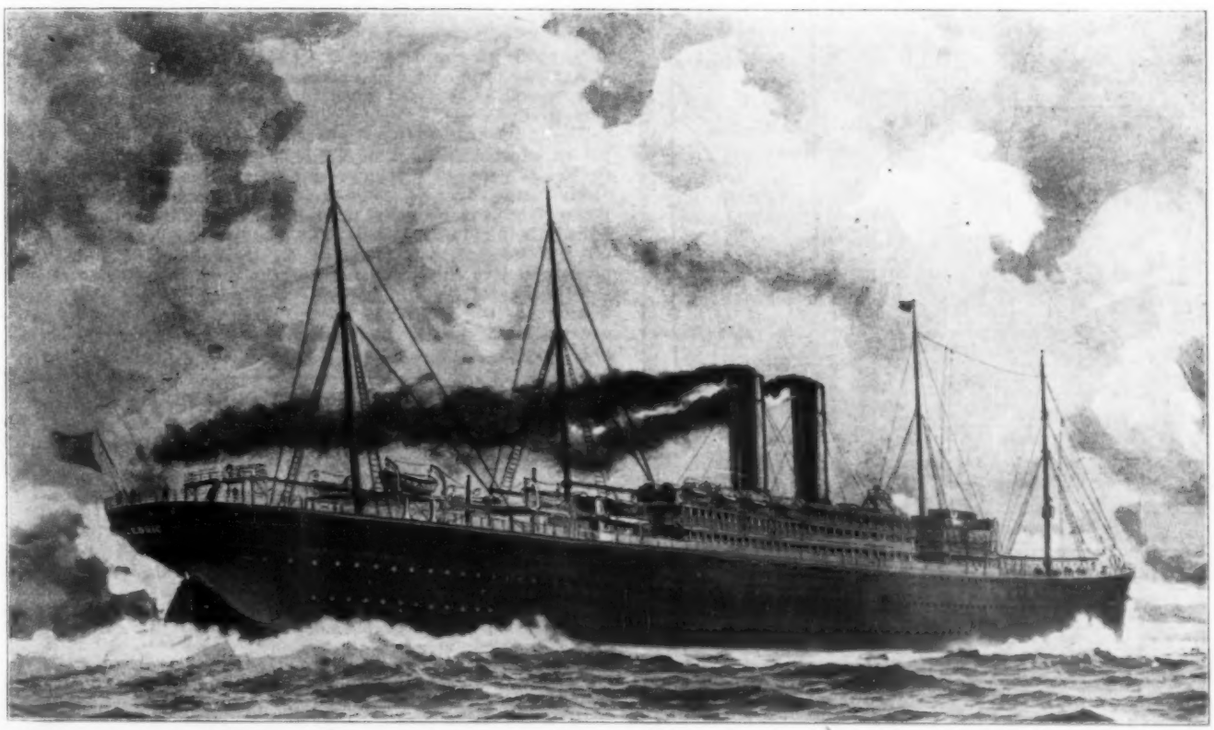
The "Cedric," the Largest Ship that Floats



Great Mechanical Leviathan of the Deep that Has Just Arrived in New York on Her First Trip **--See Next Page**

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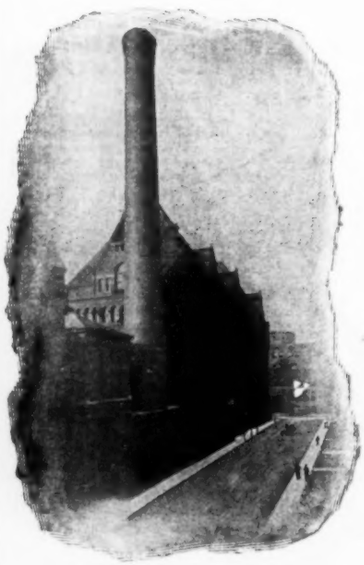

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Mention Popular Mechanics.

THE LARGEST STEAMSHIP AFLOAT

The "Cedric," the Latest Achievement of the Builders of Great Ocean Vessels, is Bewildering in Her Massiveness.

Seven hundred feet long, 75 feet wide, 49 1-3 feet deep with a capacity of 21,000 tons and a displacement of 38,200 tons, the new ship Cedric of the White Star line is the largest ship that ever rode the ocean's waves. When this monster arrived in New York a few days ago on her first trip across the ocean from England, she was hailed with wonderment by seamen and the general populace. All who gazed on her colossal proportions asked of themselves what would be the next step in the building of great ocean carriers? What would be the final achievement? Not long ago the Great Eastern amazed the world by its huge size. Then came the Oceanic, still larger. Followed fast the Celtic to claim distinction as the largest ship in the world, and now comes the Cedric, greater than all. What will be next?

The Cedric was built by Harland & Wolff of Belfast. She has nine decks and makes a speed of 17 knots. Each of her great funnels, which towers 131 feet above the keel, has a diameter of 14 feet, 3 inches by 11 feet. An army of 335 men comprise the crew of the Cedric and 92 of these are in the engine room. She has accommodation for 350 first saloon, 250 second saloon and 2,000 third class passengers, in addition to the crew.

The American Shipbuilder says: "Numbers of the shell plates of the Cedric and Celtic weight as much as 3 tons each, and some of the bigger pieces of the ships, such as the stern frame, over 50 tons each. The launching weights of these vessels far exceed that of anything ever before produced, being 14,257 tons. The dead-weight carrying capacity of the Cedric is 18,200 tons. It is difficult for the eye accustomed to these monsters of the deep to realize the full significance of her dimensions. One needs to see along side her one of the giants of 15 or 20 years ago to realize how great a stride has been made in size alone during the interval.

EXAMINATION FOR TOPOGRAPHERS.

Chance for Young Engineers in the United States Geological Survey.

The United States Civil Service Commission announces that beginning April 21 and lasting two days, an examination will be held in all the larger cities in the United States, to fill the positions of assistant topographer and topographic aid in the United States Geological Survey and positions in other bureaus of the government doing kindred work. The subjects of the examinations with their weights will be as follows:

Mathematics; including algebra, geometry, trigonometry, logarithms, mensuration and projections..... .20

Surveying; use of instruments and elements of astronomy as applied to surveying, these questions being arranged to show practical methods of field work and not theoretical or mathematical knowledge..... .20

Contour construction, topographic drawing and lettering, the latter to be executed subsequent to the examination and mailed to the Commission..... .30

Educational training and experience; to show qualifications as surveyor or engineer..... .30

The minimum age limit for applicants is twenty years. The eligibles resulting from the examination may receive appointments in the United States Geological Survey at salaries ranging from $720 to $1,200 per annum, with expenses paid in the field. The examination is open to all citizens of the United States and competitors are rated without knowledge of their names by the numbers shown on their examination papers, and are certified strictly in accordance with civil service laws and rules. Those who pass these examinations are in immediate line of promotion to the full grade of topographer and ultimately to that of geographer and administrative chief, with salaries ranging from $1,200 to $3,500. The demand for assistant topographers is so great that all on the eligible lists for the past few years have been immediately offered employment, and promotions have been comparatively rapid, progressing at the rate of $100 to $200 per annum.

Persons who desire to compete should at once apply to the United States Civil Service Commission, Washington, D. C., in order that they may have a month in which to file their formal applications.

Mexico's Canal a Masterly Achievement

Sanitation, Health and Commercial Prosperity at Once Accomplished by the Great Ditch that Serves Many Purposes

This great scientist Don Luis Espinosa, has won an international repute for the completion of this stupendous engineering problem, one without a parallel among the nations.—Henry O. Marcy, A. M., M. D., LL. D. of Boston, in a paper read before the 53rd annual meeting of the American Medical association.

Up to the present date there is no other city in the world that can flush its sewers every day as can be done in the City of Mexico, whenever it is considered necessary or desirable to do so.—Board of Public Works City of Mexico, Mexico.

This stupendous piece of engineering is entitled to take the first rank in the solution of modern sanitary problems. We have as a result the capital city of the republic rendered safe from future inundations, the ground water of the valley kept at a desirable level, the sanitary condition of the City of Mexico comparable to that of any other on the continent.—Journal of the American Medical Association.

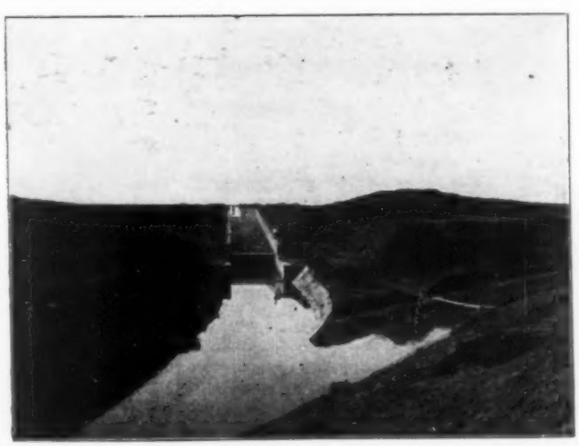
Thus do great engineers, physicians, and leading scientific publications unite in declaring the great drainage canal of Mexico, just completed, to be one of the most wonderful achievements of the century. It has wrested the City of Mexico from the grasp of disease; fortified it against the, heretofore, ever pending danger of being wiped from existence by threatening floods; made the erstwhile barren lands around to blossom with gardens and fruit farms; beautified the city of Mexico and made her capable of competing for commercial supremacy with the leading cities of the continent. Such is the good work a great engineer can do when he is honest and conscientious. And what this engineer of Mexico has accomplished with the monetary allowance and facilities at hand ought to put Chicago and Boston to shame when they compare the results. The entire cost of the work, which began in 1886, has been only $16,000,000. The Sanitary and Ship Canal of Chicago has cost more than twice that amount and will have cost $100,000,000 before it is completed. Boston's sewage system compares not more favorably in cost and results.

The present elaborate scheme for the proper sewage of the city and drainage of the valley of Mexico was inaugurated by President Diaz in 1879. The Journal of the American Medical Association in a very comprehensive report on this canal says:

"The works are composed of three principal parts, a canal, a tunnel and discharge cutting. The canal starts on the eastern side of the city and continues on that side of the Guadalupean range, between it and Lake Texcoco. The canal has a total length of nearly 30 miles. It has a uniform grade of two feet per thousand. The depth of the canal below the surface of the starting point is 16 feet and at the commencement of the tunnel, 65 feet. The sides have a slope of 45 degrees and the width at the bottom is 16 feet for the first 16 miles and 20 feet for the rest of the canal. These first 16 miles may be considered as a prolongation of the sewer since it chiefly receives the sewage. The rest of the canal has communication with Lake Texcoco, and is intended to govern its waters, as it is the lowest in the whole valley and can receive the waters from all parts for which reason the canal is designed to carry the largest volume that could pass through the tunnel, 616 cubic feet per second. The canal is crossed by four aqueducts and thirteen bridges, four of which are steel for railway service. The canal ends in a dam, the walls of which are built of stone and the front of which is strengthened by pilasters. The upper part, where the mechanism is placed for moving the sluice gates, has a width of twenty-five feet. These gates are moved on rollers in frames set into masonry. These raised, the water rushes out in a cascade on account of the difference of level between the bottom of the canal and that of the tunnel, amounting to about eight feet. The object of the dam is to control the discharge of the waters from the canal and stop the current whenever found necessary.

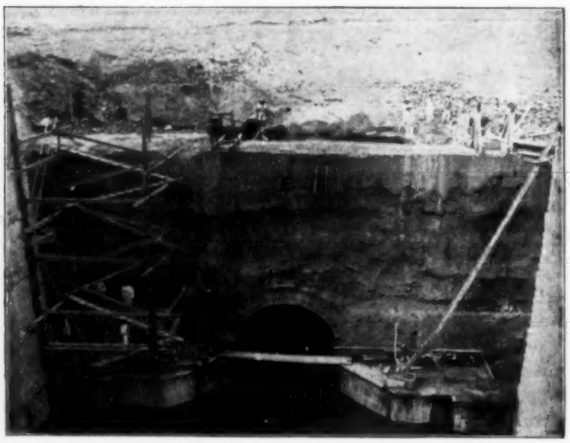
Main Canal, up Stream from Santa Clara Bridge

The entrance of the canal which receives the waters consists of an arch with a radius of 16½ feet, supported on vertical walls. This section gradually diminishes until it is reduced to that of the tunnel, so that between the commence-

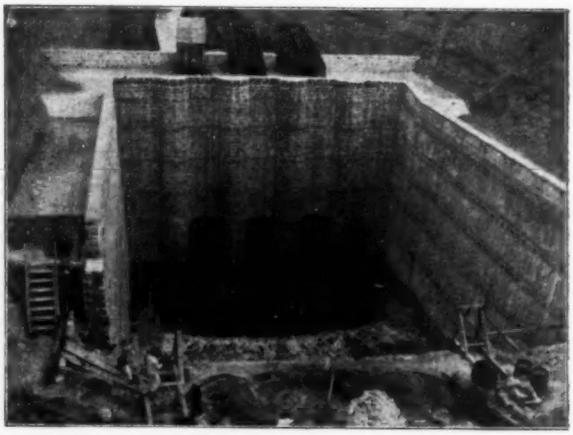


Mouth of Canal from Lake Texcoco

Main Canal up Stream, 22nd Mile



Front Elevation of Dam



Rear Elevation of Dam

ment and the final point of reduction it is the section of a cone.

The tunnel is a little over six miles long, the height is fourteen feet and the width thirteen. The tunnel has a brick lining of sixteen inches.

The tunnel opens into a discharge cutting, which is the third and last of the principal parts that compose the work and was the first to be completed. It is a mile and a half in length and was formed by opening a natural excavation made by the waters in the ravine Acaplan, the stream having been turned by a special canal. All the water flowing through the canal and tunnel is utilized for motive power and afterward discharged into irrigating ditches and used for purposes of fertilization.

POWERFUL ICE BREAKING STEAMERS—PART I.

The Russian Nadorshnie Cuts Ice 7 Feet Thick Like Cheese and Keeps the Harbor Clear.

By R. T. Greener, United States Commercial Agent at Vladivostock, Siberia.

Ten years ago, from the middle of November to the latter part of March, the port of Vladivostock was practically closed to the outer world. Mail came across from European Russia at long intervals by tarantass. The ice breaker Nadorshnie, or Reliable, was built at Copenhagen in 1896 and began work here in December, 1897, just as the railroad from Habarofsk to Vladivostock was completed. She is an iron steamer of 1,525 tons; 3,200 horsepower; 4 boilers; length, 198 feet; breadth, 42½ feet; and easily makes 5 knots in 6-inch ice. Besides ice breaking, she can be used as a life-saving craft, and can raise 1,700 tons of water in five hours.

Active service with the boat usually begins at the end of November and lasts into March, varying, of course, with the severity of the season. The ice in Golden Horn Harbor averages from 5 to 8 feet. The Nadorshnie breaks it to the depth of 7 feet, cutting it like cheese, and boasts of having been stopped but once, at a depth of 14 feet.

By the aid of this powerful steamer and her tenders, this harbor is kept open practically the entire year. The smaller boats, three in number, assist in keeping the ice broken near the wharves, and clear a passage eastward toward the docks and arsenals. In summer, the Nadorshnie puts up for the usual repairs, which are slight. She is always in commission and ready to render service as emergency dictates. She was paid for from the funds of the Great Siberian Railroad. The intention is to have another steamer, larger and more powerful.

It is claimed that the Navajo medicine men treat their patients by means of a belief that is nothing more nor less than Christian Science. All sickness is the evil spirit, says the Indian; the remedy is to get rid of the devil. The enemy of man is mortal mind, claims the Christian scientist; overcome belief in material things and there will be no sickness or death.

By unanimous vote the city council of Chicago has placed itself on record as favoring municipal ownership of gas and electric light plants.

RODE ON THE FIRST TRAIN.

With the Death of Giles P. Ransom Not One of the Passengers is Now Known to be Living.

Editor Popular Mechanics: In your today's issue of Popular Mechanics I notice a cut of the first passenger train run in America. I inclose you a picture of Giles B. Ransom, who died here recently at the age of 91 years, who rode on the "Dewitt Clinton," the engine that pulled this train on its first trip. J. P. Kelly, Bancroft, Neb.

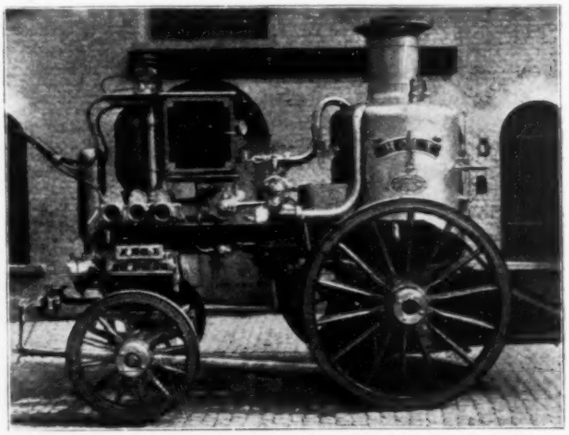
Feb. 14, 1903.

It is to be regretted that the picture of the late Mr. Ransom inclosed is not capable of reproduction. Giles B. Ransom is believed to be the last of those who rode on this first train to pass away. Mr. Ransom died at Bancroft January 29. In his life the railroads of the United States grew from 10 to 194,975 miles.

LARGEST CAPACITY FIRE ENGINE.

The "Holt" of Liverpool, Eng., has the largest capacity of any fire engine in the world, but weighs less than the smaller American engines. It throws 2,160 gallons of water per minute. The Fireman's Herald says:

"The Holt is a horse machine and weighs 8,300 pounds. It was built by Merryweather & Sons of London. The largest



Throws 2,160 Gallons of Water Per Minute

of American engines are the automobile machines of Boston, Hartford, Pittsburg, New York, New Orleans, and the one building for Portland, Me., which are rated at 1,550 gallons and weigh 18,000 pounds."

Germany has the best canal system in the world. It is now proposed to standardize the system so that barges carrying a thousand tons can be taken to any part of the country. Wide barges are used on the principle that it is easier to make a wide canal than a deep one.

Wireless Telegraphy Practicable as Cabling

Gugleilmo Marconi Tells Popular Mechanics Readers of the Success and Prospects of His System

By Gugleilmo Marconi.

THE MAN WHO TALKED ACROSS THE SEA

Gugleilmo Marconi, The Young Italian Who at 28 Has Sent a Wireless Message Across the Atlantic

Wireless telegraphy across the ocean is now as practicable as cabling. We have sent more than 2,000 words in all from Glace Bay to Poldhu and have reached a speed of 15 words a minute, which considering our clumsy sending apparatus—a mere wooden lever to connect and disconnect the current—indicates what we can do when we substitute a sending key designed for speed. With proper sending key we can easily get off thirty words a minute, and I shall be surprised if we do not soon send at a higher rate.

The Atlantic cables average about twenty-one words a minute in their regular work, I believe. And there is this vital difference in the two systems of transoceanic telegraphy: As the cable grows longer, the rate of speed in sending messages decreases, while distance makes no difference in the rate at which we can send by the wireless system.

With properly tuned instruments we can make the reading of our trans-Atlantic messages very difficult. To read a wireless message an outside station would have to be in exact tune or vibratory unison with our stations at the same moment. It would cost a rival not less than $50,000 to try the experiment on the smallest scale.

Besides we can arrange our apparatus so that the tune, or rate of vibration, can be automatically changing every moment at the same rate in the sending and receiving stations on each side of the ocean. Those who talk about the danger of having our messages read by outsiders do not understand the subject.

In England I offered to pay a large sum of money to any one who could pick up one of our wireless ocean messages after notifying me that it was to be attempted, and I even offered to lend apparatus to anyone who desired to try the experiment. No one took up my offer. But even if it were possible to read our signals—and I do not admit it is a contingency to be feared—it would be the simplest matter in the world to use a constantly-changing secret code between our stations.

Even if secrecy were actually impossible, there are thousands of messages to be sent by a cheap system of telegraphy which are not necessarily secret in their nature. If it were not so postal cards would not be used so extensively. If a man in New York wants to send a sailing date or a birthday message or any other such communication to a man in London, what does he care whether his message is read by an outside operator or not?

AERONAUT'S HAIR-BREADTH ESCAPE

Exciting Experience of Prof. Carl Meyers in a Collision With a Locomotive.

By Prof. Carl E. Meyers, Owner and Manager of the Balloon Farm, Frankfort N. Y.

That careful aerial navigation is not essentially dangerous is proven by the fact that I am before you today, alive and unharmed—after a quarter century spent in aerial travels ranging over thousands of miles, twenty-one of these United States, the District of Columbia, and the Canadas. During all this time the only real danger that I seem to have run was from a single possible collision between my air ship and a railroad locomotive. I had made a flight with my skycycle from Pittsburg, Pa., in the presence of 300,000 spectators, gathered at one Fourth of July celebration when the tempature was 105 degrees in the shade on the ground. It was a great relief to get up in the cooler air and the scene below me was the most wonderful of my experience for three great rivers united beneath me dividing a labyrinth of winding roads encircling the hillsides making the whole territory visible as an enchanted landscape garden, flat as any map or mosaic. After I had strolled about in the air half an hour tracing the paths below me, I sought a safe place for a landing, away from the mob, which would have destroyed me in their excitement had I landed in their midst. The only space clear from trees or people in my vicinity was the railroad track. I hovered close over it while two long trains met and passed, and then dropped just behind on the clear rails and began emptying my gas, when along came a wild cat locomotive with a terrible racket of bell and whistle and I almost lost my life through fright before I could hustle my half empty gas spindle off the track. What would have happened to that careless locomotive had my wasting gas exploded I can't think.

This is the only time in my high career that I have been "real scared," but at another time I nearly frightened to

Skycycle Airship, Edcircling the Great Ampitheatre of the St. Louis Coliseum

death a young Cannuck farm hand near Lewiston, Maine, one November day when I landed in freezing weather and a thirty mile wind and the only person in sight ran away screaming when I called for help to check my skycycle. He ran into the farm house yelling, "Oh Lord, come quick, the devil is after me big as a house and talks like a man."

Teacher—"Years ago the kingdom of Spain ran clear around the world."

Tommy—"Did Dewey chase it?"

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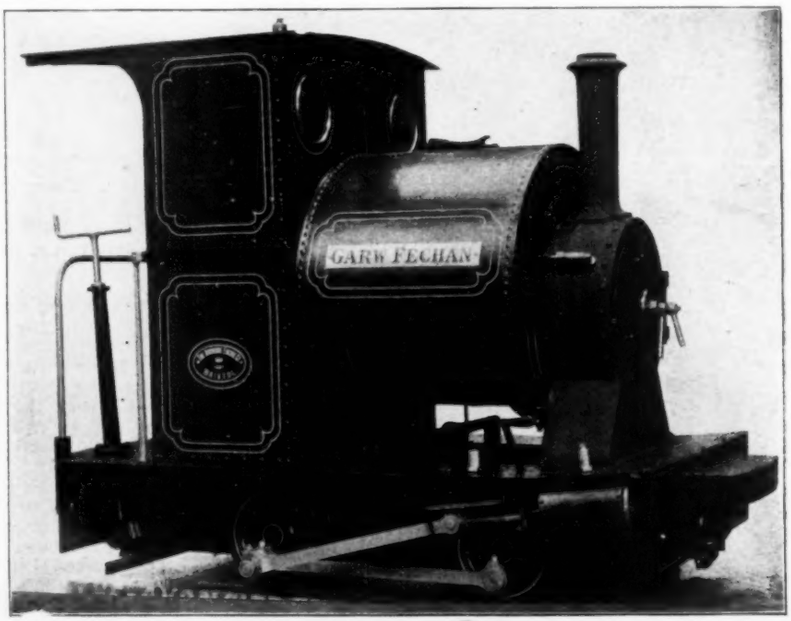
ADVANTAGES OF THE BIG FREIGHTER.

A vessel carrying 30,000 tons of freight can transport it at about one-half the cost at which the same amount of freight can be carried in three vessels each transporting 10,000 tons. Given to the larger vessel such an equipment for handling and discharging cargo that her stay in port will not be longer than that of the small vessels not so equipped, and the big freight carriers will run the smaller ones out of the trade. And for the same reasons the ports at which the big freighters can load and discharge will become points of departure for all ocean-borne traffic. The big freight carriers, like the big locomotives which now handle the freight trains of the United States, have come to stay. The fact that some ports have water too shoal to accommodate such vessels will simply result in the abandonment of such ports as ports of departure for ocean-borne freight.

Ugliest Locomotives in the World

Mechanical Freaks Used in England Frighten People and Scare Animals to Death

When an American railroad man goes to England and sees some of the narrow gage locomotives they are using over there now, he has to stop to think over what he has been drinking. It takes several looks to convince him that it is not a horrible phantom he is beholding but a real engine for hauling traffic. When a man stands in front of one of these hideous monstrosities it seems to stare at him with two great glass eyes looking out from the engineer's cab and in the forepart his fancy can behold all kinds of frightful apparitions. Dogs, chickens and cattle that have beheld these engines have died from fright. The inventor is said to have got his idea from the tale of a drunken locomotive builder who saw the thing while sleeping off a "jag." The engines seem to partake of the characteristics of the drunken idea that gave them birth. They go staggering along the track, reeling from side to side as if they themselves were intoxicated.

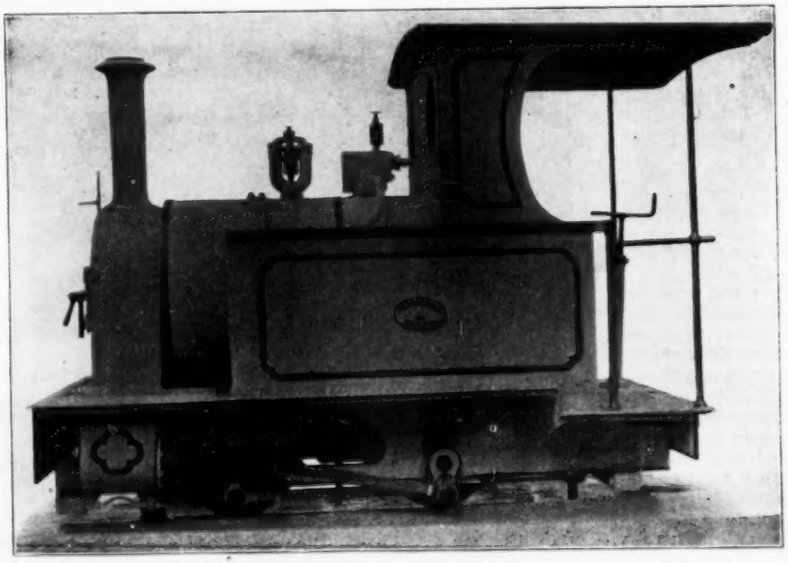


Narrow Gauge Saddle Tank Locomotive

Withal, they are said to do good work. They weigh about 6 or 7 tons in working order. There are two principal designs, known as the side tank and the saddle tank. In describing one of them the Railway Review says:

"The tractive force of the locomotive at 70 per cent cut-off is 1,944 lbs. and the engine, exclusive of its own weight, under ordinary conditions will haul 20 tons on straight track up a grade of 1 in 40, and 42 tons up a grade 1 in 100, while on a level it will handle 116 tons."

The engines were built by the Avondale Engine Company of Bristol, Eng., and are especially useful for industrial railways and for contractors' purposes.

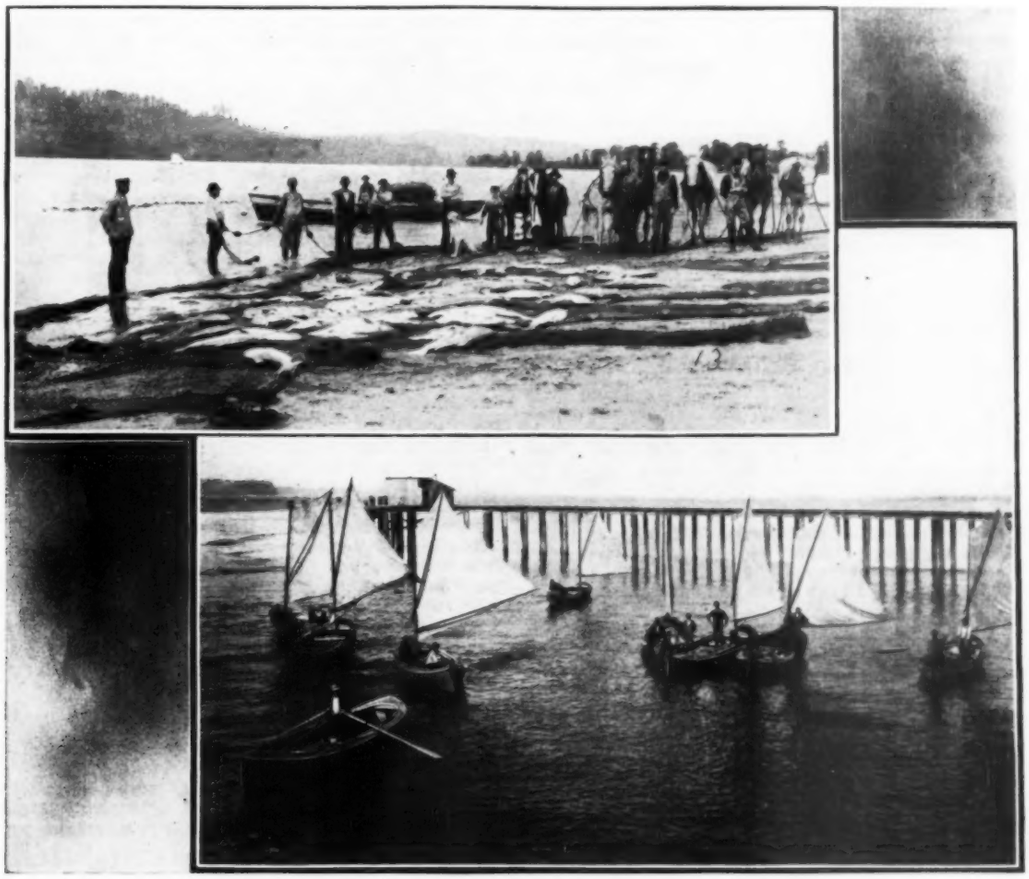


Narrow Gauge Side Tank Locomotive

SWEDE CLAIMS EDISON'S LATEST INVENTION.

Did Edison really invent his latest and much heralded storage battery of which so much is promised? This is the subject of a spirited discussion now engaging the scientific press of Europe. It is claimed that the idea was discovered by a Swedish inventor named Jungner whose patents in Europe and England antedate those of Edison in this country. It is stated that the use of the Edison patent in England will be dependent on the license he can get from Jungner, whose Swedish patent bears date of January 21, 1901, while Edison's was granted Feb. 5. If the commercial value of the new storage battery comes up to the claims of Edison and Jungner there will be a big legal battle for the English rights.

Catching Oregon's Famous Royal Chinook



The World's Finest Salmon Dragged from the Water by Men and Horses

Fishing for the famous Royal Chinook on the Columbia river is an occupation quite as enticing as it is profitable. This is the finest eating salmon that the waters produce and its home is in the swift flowing, picturesque Columbia river. The fish for the market are caught with nets. The larger nets are dragged out and hauled in by strong horses, for the load of writhing, struggling fish would be too heavy for men to pull. Then at every port along the river can be found dozens of little sail boats, like those shown in the illustration, which are quickly loaded to the oars with salmon by the aid of small nets. Millions of pounds of this rarest salmon are consumed on the Pacific coast and shipped throughout the United States by cold storage companies.

DAYS WHEN HEAT WAS A LUXURY

Eastener Calls to Mind Times When We Were Seldom Warm in Winter.

A venerable citizen of Springfield, Mass., bemoans the fact that there should be such wailings from Americans because of the shortage of coal. "Why not do without so much coal, as our ancestors have done?" he asks. "In the thirties and forties," he states, "heat was a luxury, but people did not complain. The halls of houses were stone cold even in Boston and New York. Families in winter had a fire in one room. School rooms were always cold and relays of children went to the stove to relieve their discomfort. There were colds in their heads and childblains on their feet, but still we were a fine, hardy race. The children grew up to adult age and long life with a splendid vigor. But I think we never were warm long at one time in the thirties and forties. Healthy boys and girls would have been laughed to scorn had they shrunk from buffeting the heaviest storms or declined to endure the severest cold in climbing the steps of knowledge. In those days people went to bed in unheated rooms, where the temperature was so low that no water could be left in the pitcher during the night lest it should freeze and "burst" its receptacle. Instead there was a tin pail with a gourd in it, which served the double purpose of breaking the ice and dipping out the water."

SOUTH FOR GOOD ROADS.

State good roads conventions held recently in Alabama, South Carolina and Arkansas strongly advocated the Brownlow bill providing for national, state and local co-operation in the permanent improvement of the highways.

Recently message were exchanged over the new cable between Adelaide and London, the time consumed being three minutes.

In the Santa Ana valley, California, water is scarce and exceedingly valuable. Right to a single inch sells for $1,200, and irrigated orange lands have sold for $1,800 an acre.

ONE WAY TO GET COAL.

Western Man Got a Job as Driver and the Trick Worked.

A western Pennsylvania man recently resorted to a unique method of obtaining a load of coal. He was not known personally to the dealer, and so he dressed up in his oldest clothes and went to apply for a position as a driver, having learned that several of the drivers were ill. "I guess I can put you on for several days, but I cannot promise you steady work," said the dealer. This arrangement was satisfactory to the applicant, and pretty soon he was sent out to deliver a load of coal. Instead of taking it to its proper destination he drove to his own cellar and dumped it there; then he took his wagon back to the yards, handed out the price of the coal to the astonished dealer and made a clean breast of the whole affair.

"Well, that beats anything I ever heard of," said the coal man.

Recent discoveries of graphite near Shasta, Cal., are to be worked on a large scale.

Easy Electrical Experiments

By L. P. Dickinson

THE DESIGN OF A SMALL DYNAMO—PART V.

Having made the armature and field magnets as previously described, the next thing to be done is to provide suitable means for mounting them in proper relation to each other. For this purpose a bed plate must be provided of a shape shown in Fig. 3. The general dimensions are there given, although details regarding the machine are left for the amateur to work out for himself. The bed plate should be of brass. It cannot be made of iron, for the ends of the field magnets are to rest upon it, and if made of iron much of the magnetism would pass through the iron base, instead of through the armature. In the center are two holes, ¾ inch square, which are to receive the projecting lugs on the polar ends of the field magnets. (See Chap. II.) The amateur will have to see that the dimensions on field magnet and on base, are so adjusted that the former will fit the latter. The base should be about 1 inch high. The projecting lugs slip down into the holes provided, and bolts screwing up into the lugs, provided with large washers, clamp the base and field magnet frame firmly together.

Next, bearings must be provided for. They should be made of brass castings also. The two bearings are not alike, for one of them must be made so as to serve as a support for brushes, while the other one is a plain simple bearing.

The former is shown in plan in Fig. I, and in elevation in Fig. 2.

Measure the height of the center of the circular armature

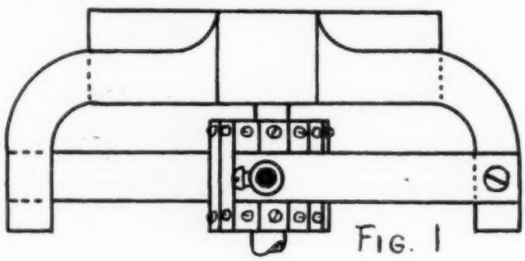


Fig. 1

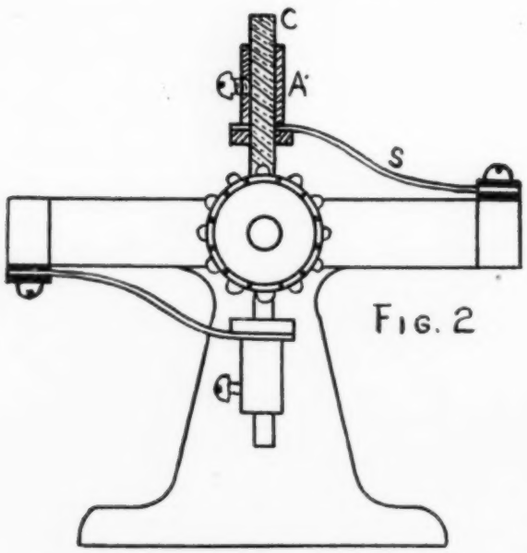


Fig. 2

space above the top of the base. This is the height of the center of the shaft, and is therefore the height of the center of bearing above base. In making patterns for these bearings, allowance should be made for loss of metal in finishing, which will amount to at least 1-16 inch.

The brush holder shown in Fig. 2 is very simple, and fairly efficient. Each brush holder consists of a brass spring S, a brass ferrule A, and a carbon rod C. The ferrule A is provided with a shoulder as shown, and a hole is drilled through the spring to receive the smaller part of the ferrule. The latter and the spring are then soldered together. The carbon rod C should be about 3-16 inch in diameter, and should fit the hole in ferrule snugly. A screw passing through the side of ferrule clamps carbon rod firmly. The springs are so adjusted that the carbon rods are pressed firmly against the top and bottom of commutator. They should slant a very little to the back, imagining the eye

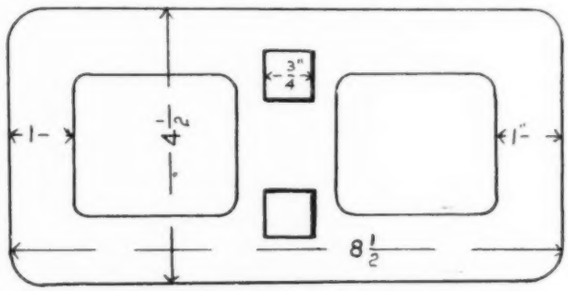


Fig. 3

to be looking in direction that commutator is to revolve. The springs should be about 3¼ inches long, 1-32 inch thick, and ½ inch wide. In Fig. 2 the upper holder is shown in section, and the lower holder in elevation. Each spring must be carefully insulated from the brass supporting arm. This is done by putting pieces of hard rubber or hard fibre above and below the spring and by also providing a washer of the same material surrounding the screw which clamps the springs to the support.

The field coils, after being joined in series, are then connected directly to the brushes. The brushes also serve as terminals for the machine, making the field coils to be in shunt with the external circuit.

When run at 2,400 revolutions per minute, the machine will give 60 volts on open circuit, and will give a voltage of 50 when delivering a current of 1½ amperes. Many details regarding construction have been left to the amateur to work out, as the purpose of this series of articles has been to teach the main principles of dynamo design, rather than the mechanical details which any ingenious amateur may work out for himself.

NATURAL OYSTER BEDS DEPLETED.

Once Found in Great Quantities Are Now Produced Only by Cultivation.

The natural oyster beds of the United States are rapidly becoming extinct as they long have been in Europe and Asia and the oysters are produced by cultivation. France and Great Britain lead all European countries in the production of the oyster and its culture is carried on more extensively in France than anywhere in the world.

The Fishing Gazette says: "When the first settlements were made in America, oysters were found in lavish abundance all along the Atlantic coast from Maine to Florida, the principal beds being in Chesapeake Bay, Cape Cod and Long Island Sound. Constant fishing, however, soon had its effect upon the more Northern fisheries, and by the year 1860 the natural beds of the North Atlantic coast were exhausted. Chesapeake Bay and the waters along the coast of Virginia still produce a good supply, and the young were transplanted from these sections to the more Northern beds, where they were fattened and prepared for market. Were it not for the supply of seed oysters secured from these Southern waters, the States north of Connecticut would be in the same condition as the European countries in oyster culture. The public beds along the coasts of Connecticut, New York, New Jersey and Delaware are so far depleted that the supply is very irregular and uncertain and the oyster found is very small. In the Chesapeake Bay and Southern waters the public reefs are somewhat exhausted, the oysters are small, and many are transplanted to private grounds for maturing. Oysters are found in the Gulf of Mexico, and also to a small extent along the Pacific coast. Seed oysters from the Atlantic coast have been planted on the Pacific coast, but with little success.

Found the World's Biggest Gold Nugget

Sam Napier, Who Died in Poverty in a Lumber Camp, Once Dined by Kings and Queens

Samuel Hawkins Napier, who died in a miserable lumber camp in Canada a short time ago, was the discoverer of the largest nugget of gold the world has ever seen, and at one time was the lion of all London and one of the most talked of men in England. He died in abject poverty while sitting at a rough table by a dim candle light, with only a dog for his companion. He had gone into the pine woods of Canada to work as a laborer for a lumber company.

It was in 1857 that Napier gave up the sea and joined his brother at the Kingowar diggings near Melbourne, Australia. They secured a claim that was just 36 feet square, but beneath the surface lay a chunk of treasure that made the eyes of kings and queens sparkle when they saw it. Here is Napier's own story of the find, which he told before he died:

"We had got down to the pipe clay bottom, which marked the bed of an ancient river, when my pick struck something hard. I knew at once it wasn't a boulder, for there was not the same ring to it. It struck dead. Scraping away the dirt I caught sight of the bright yellow of pure gold. We were afraid that some one would learn of what we had found and rob us. We therefore covered it with loose dirt and sat down to plan. We discussed scheme after scheme until we worked ourselves into a great state of anxiety. We finally decided to borrow a tub and cautiously wheel it to our camp, taking turns at wheeling and agreeing that if any one spoke to us one was to stop and talk and the other was to wheel right along. Just about dusk we landed the nugget in the tent. We threw it under one of the low beds and sat down to wait until midnight. Early in the night we put out our light and pretended to go to bed. Instead, with pick and shovel we dug a hole six feet deep right in the middle of our tent; there we buried the nugget and filled in the earth so as to not leave a trace of our work. No one had seen the nugget but ourselves and it was now buried six feet out of sight.

But a nugget six feet deep was no use to us. We must get it to Melbourne. There was plenty of time for that, and, besides, there might be other nuggets in our claim. We went to work every day and left the tent open to avert suspicion. For three months the nugget lay there buried and at the end of that time we washed out our claim. We found a number of nuggets in the same hole, one of which weighed eight pounds. Armed with a shotgun and revolver, we started in a one-horse cart and in due time reached Melbourne. Next day we deposited the nugget in the bank and our fears were at an end. The news spread like wildfire and thousands rushed to the Kingowar gold fields. While in Melbourne we named the nugget the Blanche Barclay, in honor of the beautiful daughter of the governor, and by that name the model in the British Museum is yet known. The bank gave us an insurance of $50,000 for the safe delivery of the nugget in London, and we sailed for England.

When we arrived the papers wrote up the story of the nugget and we at once became famous. The queen sent for us and we dined in Buckingham palace. We drove down from the Bank of England under heavy escort, taking the nugget with us. Her majesty and the Prince Consort received us most graciously, and the Prince of Wales, who was a lad of 15 years then, showed a very deep interest in the nugget. I do not wonder at that, for it was one of the prettiest sights one could see. It was 23.7 carats fine, or as nearly absolutely pure gold as is possible to get. Then the nugget was put on exhibition at the Crystal Palace, for which privilege we were paid $250 a week. We lived in a swell house on the Surrey side. This lasted for three months, during which time Sir Roderick Murchison had a cast made of the nugget for the British Museum. The work was so perfectly done by an Italian that you couldn't tell one from the other until you lifted them. He gave me a duplicate. Finally we sold the nugget for $60,000. It was not worth more than $50,000 intrinsically, but being the largest and finest gold nugget ever found we got $10,000 more for it than its real value."

GRAIN ELEVATOR FALLS WITH A CRASH.

Another Accident Instances the Inferiority of the Old-Style Grain Storages.

Inadequacies of the old style elevators is further demonstrated in the recent disastrous collapse of the Collier & Songer grain storage house at Freeland Park, Ind. With a crash that was heard all over the town the structure hurled itself to the ground and a dense cloud of dust that resembled smoke went up from the spilling grain. The collapsed structure with the grain that poured from the demolished walls is shown in the accompanying illustration. The Grain Dealer's Journal says:

"The grain was thrown out a distance of 150 feet together with a section of roof. The elevator contained 12,000 bushels of oats and 44,000 bushels of white and yellow corn. The piers underneath the center of the building gave way first, throwing more weight on the north wall, which dropped and allowed the structure to fall to the north as if it had been pushed over."

Collapsed Elevator at Freedland Park, Ind.

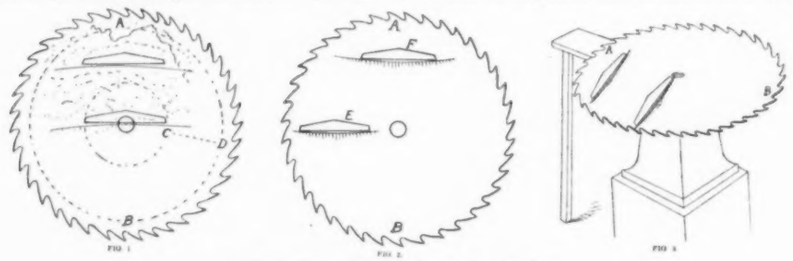
ESQUIMAUX BECOMING EXTINCT.

The Esquimaux are becoming extinct through the ravages of a peculiar and unknown disease. When explorers first went among them there was believed to be at least 3,000 from Point Barrow to the Aleutain islands. Now, it is said, not more than 200 can be found.

SHOP NOTES

TENSIONING CIRCULAR SAWS.

Every man who is employed in a woodworking shop is interested more or less in circular saws, writes a contributor in the Wood-Worker. I will try to show how anybody can straighten a circular saw if they will follow these instructions. Place the saw on the anvil. Have a board fastened to the anvil and a support at the other end about an inch lower than the height of anvil. In testing the saw let the edge marked A rest on the board, and lift up edge B so the saw will rest only at A and B. If the saw showed straight while in a perpendicular position on the floor, and shows round under straightedge when testing on anvil, like in Fig. 1, that saw needs tensioning (or "dropping"), and will require a lot of hammering between the lines C and D, Fig. 1.



Showing How to Straighten a Circular Saw

We take a small saw, say about 16 inches, and test it as in Fig. 3. A saw of this size does not have to show any tension under the straightedge, no matter where applied, if lifted as in Fig. 3; it must show straight. Use a straightedge not longer than half the diameter of the saw, square across, and where a lump shows hammer it down, going clear around the saw, then turn it over, leveling down lumps wherever you see one. Always make your tests in the dotted portion of saw, as shown in Fig. 1. Keep this up until all high places have disappeared.

After you have this saw level, after thoroughly trying both sides, it will be pretty nearly ready to run. If by placing straightedge as at E, Fig. 2, it shows straight, and by pressing down a little with your thumb, it opens up as at F, all around the saw on both sides, and about half as much if the same straightedge is applied across the eye, I think you will find the saw doing good work after being properly set and filed.

Large circular saws are treated just the same, but the amount of tension required can only be determined when size, speed and power are known. I do not claim to know all there is to it, but I have no trouble to make 54-inch 9-gage saws stand up in all kinds of wood with the thermometer 20 or more degrees below zero. We are cutting birch, maple, hickory, elm, basswood, pine and oak every day now.

A subsidized theater is projected in Paris with a view to enabling French students to learn the English language.

The average monthly production of gold at Cripple Creek, Col., exceeded $2,000,000 a month in 1902.

OIL COOLED GASOLINE ENGINES.

The substitution of oil for the water employed in cooling the cylinder of gasoline engines does away with the risk of damage to the engine by the freezing and expansion of the water jacket.

Very small engines can be cooled with oil by replacing the water tank with an ordinary hot water heat radiator.

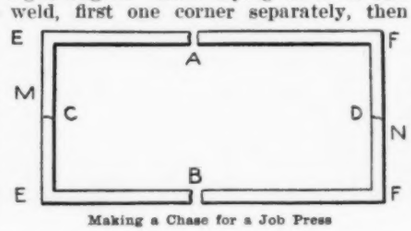
For engines of medium size a special radiator is required in the form of a vertical boiler containing a great many small tubes open at both ends. The top of the boiler is covered by a cone and short stack into which the exhaust from the engine is conducted to induce a draft through the tubing. The hot oil is fed into the top of the boiler and the cooled oil drawn off at the bottom to circulate back through the jacket of the engine.

Large engines will require the addition of a small centrifugal pump to keep the oil circulating rapidly. This form of cooler has been successfully applied to engines of over 40 h. p. It cannot freeze, requires no attention, and works well under any climatic conditions. The tank, connections and jackets are sealed airtight so that no waste of the oil can take place, and the original supply will last as long as the engine.

TO MAKE A CHASE FOR A JOB PRESS.

I was given the job of making a chase for a job press, and nearly made a failure. I knew I was up against a hard problem, but I could not afford to fail, says a writer in the American Blacksmith.

To make a chase is a nice job, for it is always a hard job to make a rectangle, i. e., a figure having four sides and four right angles. After trying to bend and weld, first one corner separately, then two corners, and still meeting with no success, I finally did succeed by the following method:



Making a Chase for a Job Press

Bend or weld each corner separately. In the figure M may be made in one piece, or the angles may be made separately and welded at C and D. Of course the distance from E to E, and from F to F, must be the same; after these angles are made to fit the try square. Weld in the center at A and B, and the work is finished.

WELDING COMPOUND.

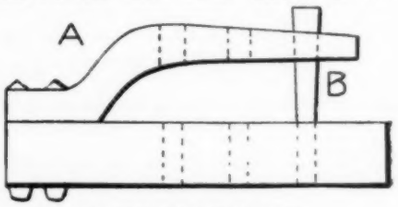
G. H. Stone, Kokomo, Ind., asks for a recipe for a welding compound for steel and iron. The following known to the trade as the Belgian patent is approved: Iron filings, 1,000 parts; borax, 500; balsam copavia, 50; sal ammoniac, 75; mix, heat and pulverize. Another is as follows:

Borax, 5 lbs.; sal ammoniac, 1 lb.; prussiate of potash, ½ lb.; rosin, ½ lb.; alcohol, ½ pint; water, ½ pint; iron filings, ½ lb.; melt in iron pot over gentle fire; allow compound to boil a few minutes until it becomes dry and charred; then pulverize.

A GOOD PUNCHING GUIDE.

The sketch which accompanies this article shows a very useful article for use in any smith shop. I have never seen anything exactly like it, says a correspondent in the American Blacksmith.

To make this punch guide I take a bar of steel about five inches long, five-eighths to three-fourths of an inch thick, and one inch wide. Two or three holes of the desired size are then punched, as shown; after which a piece of one-quarter inch steel is punched with the same number of holes in the same position, but somewhat larger, so as to hold the punch. The second piece is then fastened to the first by means of two rivets, and the tool is completed. A represents spring, B the punch. The use to which I apply this tool is punching holes in three-sixths inch boiler steel. If the end of the punch is carefully tempered you can punch thousands of holes. You can have several different sizes of holes and punches. If the points of the punches are kept in order punching will not damage or split the plate. This device will save considerable time in drilling holes.



Handy Guide for Punching

MARBLE EFFECTS IN ENAMELING.

To produce marble effects a Hungarian inventor deposits the enameled powders or colors in small heaps side by side at the highest part of the article, or these may be mixed, or placed one above the other. When the article is fired in a kiln, the molten enamel runs down the sides and produces color strips, which may cross one anther or run side by side.

TO GLOSS LEATHER, PAPER, ETC.

A glossy coating on leather, paper, textile fabrics and similar materials, is produced by applying a thick solution of celluloid to the surface. The celluloid solution may consist of 100 parts of amyl acetate or amyl acetate and acetone, 7 to 12 parts of celluloid and 10 to 13 parts of castor oil.

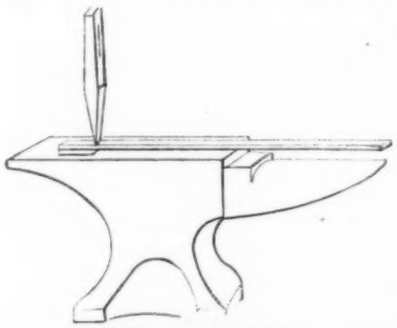
HINTS TO INVENTORS.

How often have you sat in a rocking chair which in a half hour's rocking would travel across the room? Do you know the cause? One of the largest furniture manufacturers in the country, writes Popular Mechanics there is a fortune for the man who will find some means to prevent this travel in a rocking chair.

SHEARING WITH A CHISEL.

A point in shearing metal was early learned while cutting off pieces from a bar about ¾ inch wide and 3-16 inch thick. A sample was placed at the side of the bar and the cutting off had been done in the usual way, by a cut first on one side and then on the other, and then a hammer blow to break it off, says a writer in the American Machinist.

It happened on one occasion that the sample was placed under the bar as shown in the cut. The boy thought he could mark the length just as well in that way, and so he struck one blow, as he had been doing. He saw another piece on top of the sample and wondered that he had not noticed it before. He



Shearing With a Chisel

placed the bar again in the new way and, intending to mark the length, struck another blow. To his surprise he saw that he had found a way to cut off the piece with one blow in about one-quarter the time required to mark both sides and break it off. The sample had acted as one blade of a shear and the chisel as the other blade. In the new way the chisel was all chisel, and not part chisel and part hammer, as when the anvil caused some compression of the stock under the chisel.

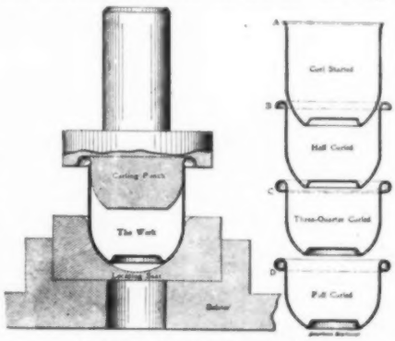
TESTING TWO-CELL STORAGE BATTERY.

The Motor Age says to test a 2-cell storage battery get a 4-volt, 1-ampere incandescent lamp, and after cutting the battery out of the charging current, put the lamp in circuit with the battery for a few seconds only. If the battery is fully charged the lamp will give out a brilliant light. On no account use a pocket ammeter to test a storage battery; it will injure the battery if kept in the circuit long enough to get an accurate reading.

Every experienced rubber worker knows that by mixing india rubber with a very large proportion of litharge upon hot mixing rollers we obtain a product which at first behaves quite normally, but which on continued mixing attains a remarkable degree of toughness.

CURLING SHEET METAL.

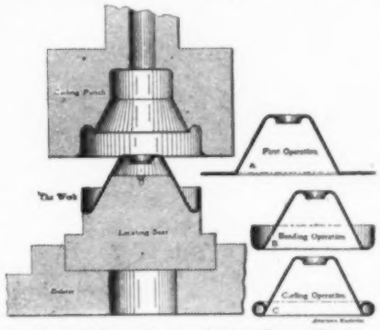
During the past few years press machines have been constructed for doing many things in sheet metal work which formerly had to be done by spinning. Curling is one of these, says the American Machinist, which describes "curling"



Curling a Straight Walled Shell

as producing a curved edge of any formed or drawn article of sheet metal. Dies and press machines enable the turning out of from 2,000 to 8,000 pieces of work in ten hours. The manner of using the die and the progress of the curling is shown in Fig. 1, the cut.

The sketches at the side show how the upper die curls the edge of a half-round shell. In the first stage A the metal has commenced to curl; at the next stage B the metal has curled to a half-circle of the width of the curling groove in the upper die. At C the third stage is shown. The punch continuing downward, as the edge of the shell passes the center of the curling groove the pressure is exerted on the top of the half-round curled edge and causes the metal to curl further around until the circle is complete, as shown at D. In this manner only one operation is necessary to curl the edge of a shell of the type shown, as the metal once started around the curling groove of the upper die will follow and curl on the same radius as long as the pressure continues, or until the edge strikes the side of the shell, when it will curl within the first curl. Thus a shell may be quarter curled, half curled or completely curled by the



Second Operation in Curling Taper Work

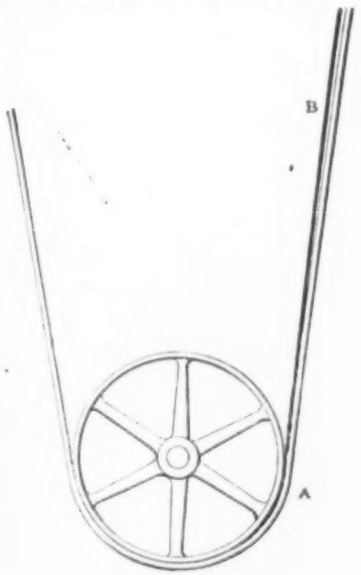
same die, according to the length of stroke to which the die is set.

When the edge of a shell of the shape shown at A, Fig. 2, is desired to be curled as shown at C, the work will require two dies. The first die is to bend or form the edges to the upright position and the second die to curl the edge. This second die is shown in Fig. 2. The upper die is made so as to make the entering of the edge of the shell positive within the curling groove, and also so that the straight inner wall will hold the wall of the shell while the edge is curling, thus preventing any bulging during the process, which would occur if the inside of the tool was finished like the outside. In this manner the metal is held tightly, and as the ram descends it must follow the shape of the curling groove.

BENDING HOOPS ON A PULLEY.

The usual way of bending hoops for a cider press was by hammering until the "professor" hit upon the idea of using a pulley and belt to bend the hoops on, says a writer in American Machinist.

The usual way of bending hoops for a cider press was by hammering. "The Professor" hit upon the idea of using a pulley and belt to bend the hoops, and he found that, starting as in Fig. 2 and running once around, made the hoops ready to be riveted. The old note-book from which this is taken says that a pulley should be selected about one inch smaller than the required diameter of the hoop, and that the belt should be



Bending Hoops

pulled by hand. It would seem that the straight part of the belt between A and B is the main factor in bending, because it holds against the bending stress exerted by the pulley and belt. This is clearly an improvement in a process without new tools, as the stock was bent around the cone pulley of a lathe that happened to be out of use.

WANTED, A WIRELESS BELL.

The wireless telegraph and the wireless telephone we have already, says the London Graphic. It is obvious that if through the air and through the earth motion at one end can be conveyed to the other end, the wireless bell is not an extravagance of fancy. How long will it be before the inventor will provide us with the wireless bell, that will enable us to diminish the network of wires which has to be introduced into every modern house at such considerable cost? A fortune waits the discoverer of an inexpensive wireless bell system.

PEARLS TO COST LIKE DIAMONDS

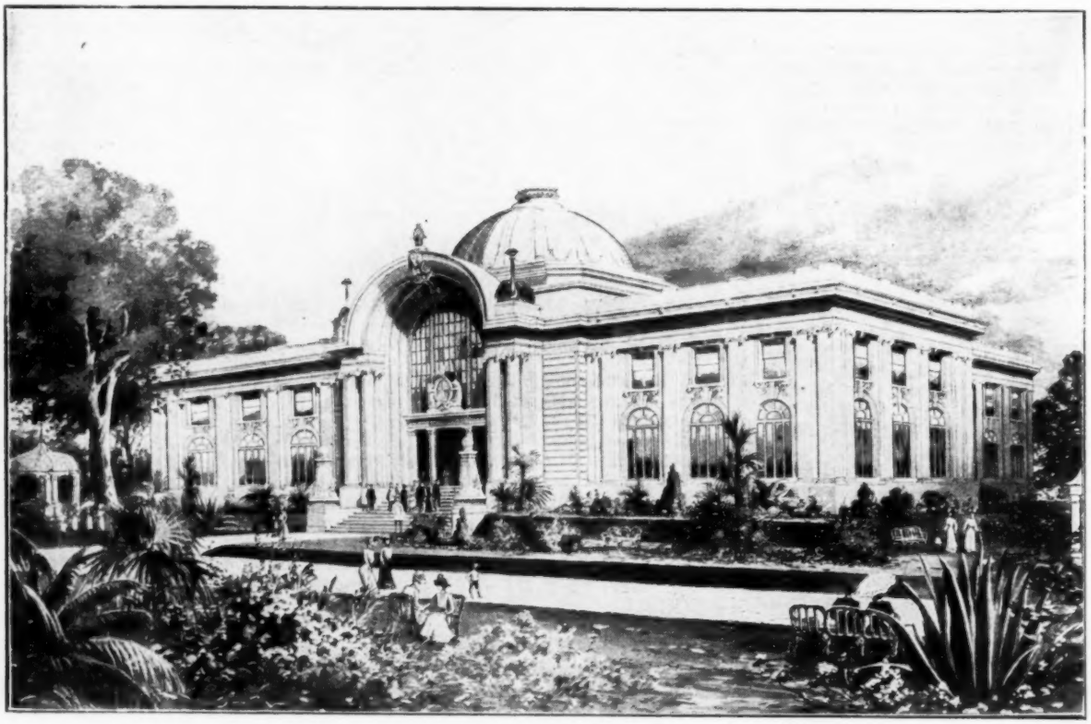
Fisheries Being Exhausted in the Mad Search for Button Material.

The day of the pearl fisheries in the United States is nearing an end, and the time is not far away when pearls will be as valuable as diamonds. The pearl bearing clams are disappearing from the rivers of Arkansas and the Mississippi at a rate that will soon make them extinct. Pearl buttons which are made from the shell of the clam are largely responsible for these conditions. Everywhere the clam was found button factories went up in great numbers. Not content with the devastation being wrought the fishers built floating factories and as fast as one section of the river was depleted of its valued yield the factory floated to another sandbar where the clams could again be found in goodly numbers. Thus the shell of the bivalve has made it more in demand for commercial usage than its "prize-package" manner of yielding up pearls. The Black and the White rivers of Arkansas have had nearly every clam removed from their bottoms in about a year. The Mississippi has been drained and now the Cumberland river in Kentucky is undergoing an invasion by the pearl hunters.

TO REVEAL MISSOURI'S GREATNESS.

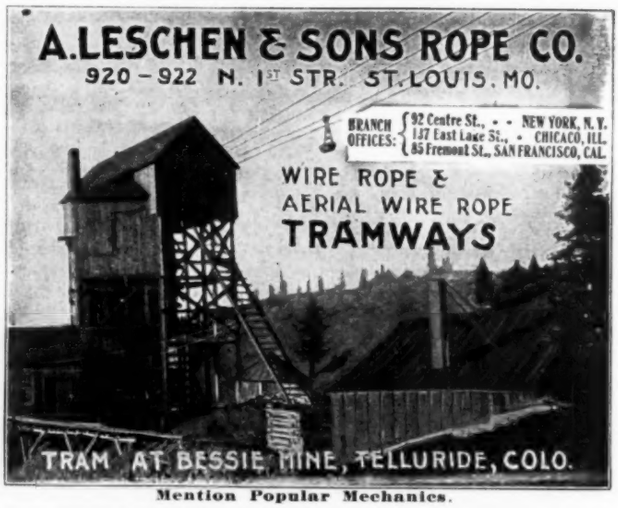
State Building at Fair to Be of Native Material Throughout.

The finest state building at the St. Louis world's fair will be the Missouri building. It is to occupy the very most conspicuous and desirable location on the grounds. The building is to be on the high ground south of the government building and in the very geographical center of Forest park. It has beautiful natural approaches on every side. This is to be one of the few buildings of the fair that is to be a permanent structure. All the material used in its construction is to come from the state of Missouri. The basement will be of Missouri granite; above will be Missouri cut stone; the great dome will be covered with Missouri lead or zinc; Missouri marble and onyx will be employed in finishing the rotunda; walls, columns and all finishings will show original materials. All the wood and even the nails in the structure and the tools used in its building are to be of Missouri manufacture.



Missouri State Building at World's Fair

The ancient system of irrigation in Egypt was perfected during the twelfth dynasty, about 4,000 years ago.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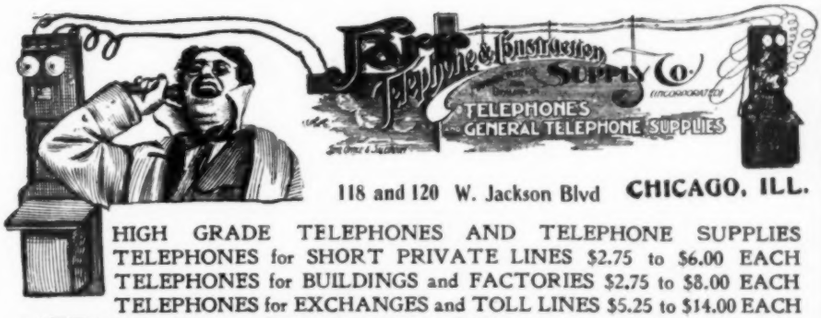
Henry Sellmann, founder of the sardine industry in Maine, died recently at the age of seventy-two.

A movement is on foot among the farmers of the West to organize a gigantic union among the farmers of the United States as a means of protection against corporations with which they have dealings.



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The "Americanization" of Assiniboia

Verdant N. W. T. Growing Great Under the New Influence

"The American invasion" of Canada is making that country blossom as the most sanguine inhabitants never dreamed of before. Probably nowhere are these conditions more manifest than in Assiniboia, N. W. T., which the American farmer is making famous for its wheat. Indian Head is the center of the recent development of this section. Here a government experimental station has kept a record for eight years of the yearly wheat yield on the experimental farm which shows an average of 38 bushels to the acre. Farms operated by Americans here produce about 54 bushels per acre. None has made so low an average as the experimental station. Since the Americans have settled there great elevators have been built and the country seems infused with new life. The engraving shows a string of elevators that have recently been built at Indian Head along the track of the Canadian Pacific railway. The Grain Dealers' Journal says: At present the glut of grain is so great that the farmers have had to build more than 100 temporary flat warehouses in the vicinity of this station. Cars are lacking for the long haul to Lake Superior. The distance is 300 miles to Winnipeg and 600 miles to Duluth.

City of Elevators in Assiniboia

Beekeepers stung frequently during two seasons, it is said, subsequently show perfect immunity to the poison and the sting produces no pain.

Thirty-two more locomotives are required for Japan. Tenders were sent in from seven firms, three Glasgow makers, one English firm, three German establishments, and no American.

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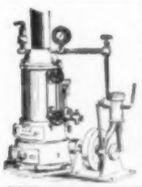

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ROPE CLIMBING DEVICE.

Clamping Jaws That Holds a Man Suspended By His Own Weight.

A device that will enable any man to climb a rope with little danger of falling has ben invented by Charles E. Knop of Detroit, Mich. It is especially adapted for use in mending standpipes, painting chimneys and other work where it is difficult to support a scaffold conveniently. This apparatus consists of a pair of hinged members with footholds at the outer ends and a clamp near the joint, composed of two semi-circular jaws which are forced together by the weight of the person whose feet are in the footholds. In the employment of the device but a single rope is needed, the upper end being securely fastened aloft, and the lower end drawn through the clamp until in position for the operator to insert his feet in the stirrups and begin the ascent. By supporting the weight with the hands and spreading the feet apart slightly the legs can be drawn

Makes Rope Climbing Easy

up to place the clamp in a new position, when the weight is transferred to the clamp and the hands secure a hold higher up on the rope. By thus alternating the weight between the clamp and the hands the climber ascends quite rapidly and has the advantage of being able to rest at any point without any more exertion than would be required to stand on the ground.

HOW TO PAY THE VENEZUELA CLAIMS.

An English paper suggests a scheme to raise the money with which to pay the Venezuela claims. The plan is for the bands on board the English and German warships to land and give band concerts each evening to which the natives are to pay a small admission fee.

The exports of Germany have increased 30 per cent in the last ten years and those of the United States 29 per cent.

Popular Mechanics is the medium for inventors.

REMARKABLE FIRE AT GREAT ELECTRIC PLANT.

Lightning, and in the winter, too, struck the greatest electric plant in the world at Niagara Falls; did thousands of dollars damage, and deprived a dozen cities of electric power to run street railways, factories and lights. On the night of January 29 lightning (the old fashioned, thunder storm variety) made a lunge at the 50,000 horse-power being generated by Niagara Falls. The building and fittings were supposed to be fire proof, but the 52 immense cables conducting power to Buffalo and other places were burned, and the fire department threw tons of water before the fire was put out.

The Electrical Review says: Despite the extent and nature of the trouble, the Niagara Falls Power Company was prepared for it. As soon as the fire had been put out the company's forces were marshaled under the direction of Superintendent Barton, and the work of making repairs immediately begun. For the remainder of the night there was surprising activity. In order to meet just such unfortunate occurrences, the Niagara Falls Power Company keeps in reserve a large amount of cable and parts of machines liable to be damaged by accident.

In order to extinguish the fire in the transformer station the firemen had found it necessary to throw many tons of water into the building. This wet some of the transformers and later caused delay. All cable connections had been made to give power to Buffalo, when water in a transformer caused a postponement of the service until 4:30 o'clock Friday afternoon, but at that hour, about eighteen hours after the fire, 10,000 horse-power was being sent from Niagara to Buffalo.

SUBMARINE BOAT IN 1620.

Those who believe submarine navigation to be a master achievement of modern science and mechanical skill will be interested in learning that a submarine boat navigated the Thames river in London as early as 1620. The boat housed twelve rowers and several passengers. The inventor was Cornelous Drebbel, a Dutch scientist and adventurer. Escaping from prison in Bohemia he went to England and was heartily welcomed by King James. Drebbel's boat was propelled by oars. It had water ballast compartments with pumps for emptying them to restore the bouyancy of the vessel. Respiration was obtained by means of a liquid, called "quintescence of life," a former product of the inventor's genius. This and his artificial method of illumination are believed to be lost arts. It has been written: "In this boat a person could see under the surface of the water and without candle light as much as he needed to read in the Bible or any other book." The vessel was never fully perfected and after Drebbel's death in 1634, was left to rot on the banks of the Thames.

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THE MECHANIC FROM LOWELL.

He came out here frum Lowell where he'd worked six months or more;
Went through a sort of trainin' school a year or two before,
An' called himself a fust class man, an' even more than that
He had mechanics an' the arts an' sciences down pat.
He said he'd studied drawin' an' geometry he knew;
There warn't no crooked labor in the shop he couldn't do;
Had run a Corliss engine an' at forgin' was a "bird,"
In fact he was a "corker," an' we took him at his word.

He give us p'ints on planin' an' he showed us how to file,
An' said the way we chiseled couldn't help but make him smile.
He said our tools were ancient, an' our methods way behind,
An' he would modernize 'em if the foreman didn't mind.
We felt like small pertaters, an' we asked ourselves if they
Had more like him in Lowell, 'n' why they let him git away.
We thought we were mechanics till he put us in the shade,
An' longed to go to Lowell where sech geniuses were made.

Bime'by the boss had leisure an' he listened to his tale;
We thought the Lowell stranger run the limit uv his scale,
He talked an' spit an' argered like a man who knows his hold,
An' thought the boss would figger he was worth his weight in gold.
The boss was dull, however, an' he couldn't see his worth,
Tho' admitted it was in him to revolutionize the earth.
A career like his, he told him, he wouldn't help to check,
An' he'd better go to Boston an' be president uv Tech!

—Joe Cone.

BRIQUETTE MACHINERY FIRMS COMBINE.

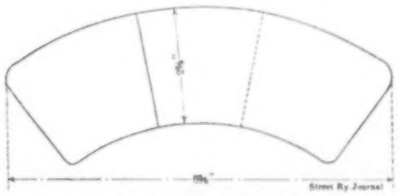
The three large German companies engaged in manufacturing machinery for the making of briquettes out of coal waste have been combined into a syndicate for the purpose of exporting this machinery on a large scale to America. The factories interested in the syndicate are located at Ernfield, near Cologne; Buckau, near Magdeburg; and at Zeits in Saxony. They are said to have already received large orders for machinery from the United States.

Meteorological instruments of gigantic size have been designed for the summit of Mont Blanc. They are to be read by telescope from Chamonix at the foot of the mountain.

DEVICE FOR HOLDING ARMATURE BEARINGS.

A handy home-made device for holding armature bearings during the turning-out process after the babbitt has been cast is described in the Street Railway Journal:

A frame for holding the bearing shell has been made, which rests and is bolted on the tool carriage of the lathe. The bearing shell is clamped into the middle of this frame. On each side of the bearing shell is a bearing of the right size for a 1¼-inch shaft. These two bearings have passed through them a boring bar, which is a piece of 1¼-inch shafting, with



Sections of Commutator Clamp

a boring tool mounted on a slot in it, and which is rotated in its bearings by a lathe dog driven from the face plate of the lathe. As the boring bar is fixed in bearings which are in line with the newly-babbitted shell, and as this has been clamped in to be bored out, there is no delay in getting the shell correctly centered.

BIG AUTO SHOW FOR INDIANAPOLIS IN APRIL.

Indianapolis will have a great automobile show the first week in April. This has been made possible by the generosity of the Fisher Automobile Company, which has placed its new building at the disposal of the managers of the enterprise. No other building in the city was large enough. Great interest will center in the Winton "Bullet," the fastest machine in the world, which will race with Fournier's Flyer. There will be numerous new and novel features. Foreign exhibits are already arriving.

MOTOR MILK CARS.

The motor milk car has made its appearance in London, and threatens serious injury to the railway companies. As yet it is only used to distribute milk rapidly in the city, but in a short time the rich milk companies may bring their cans to town from the farms, and so diminish their expenses in this direction.

British firms are experimenting in the manufacture of reversing turbines for marine use.

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